



Caernarvon Freshwater Diversion Advisory Committee 2014

Caernarvon Freshwater Diversion Advisory Committee 2014 Meeting Tuesday, November 18, 2014





- INTRODUCTION

- History
- Features
- Goals
- Project map w/pre-post lines



- **U.S. Congress -Flood Control Act of 1965**
- **Water Resources Development Act of 1974, 1986, and 1996**
- **Re-introduce freshwater, sediments, and nutrients into the marshes and bays of the Breton Sound estuary**
- **Constructed between 1988 and 1991**
- **USACE constructed; CPRA operated with oversight and advice from Technical Work Group and Caernarvon Interagency Advisory Committee**



Caernarvon Outfall



- Located on the east bank of the Mississippi River (mile 81.5) in Plaquemines Parish
- Five, 15-ft gated box culverts
- 8,000 cfs
- Operations began August 1991





DANGER
KEEP OFF

DW F 9/1
RQ 70V



06/11/2014



- Enhancement of emergent marsh vegetation growth
- Reduction of marsh loss
- Increase significant commercial and recreational fisheries productivity
- Increase significant commercial and recreational wildlife productivity



Freshwater Diversion

- Salinity Control
- Not designed to build land, per se
- Ancillary benefits to marsh and land growth

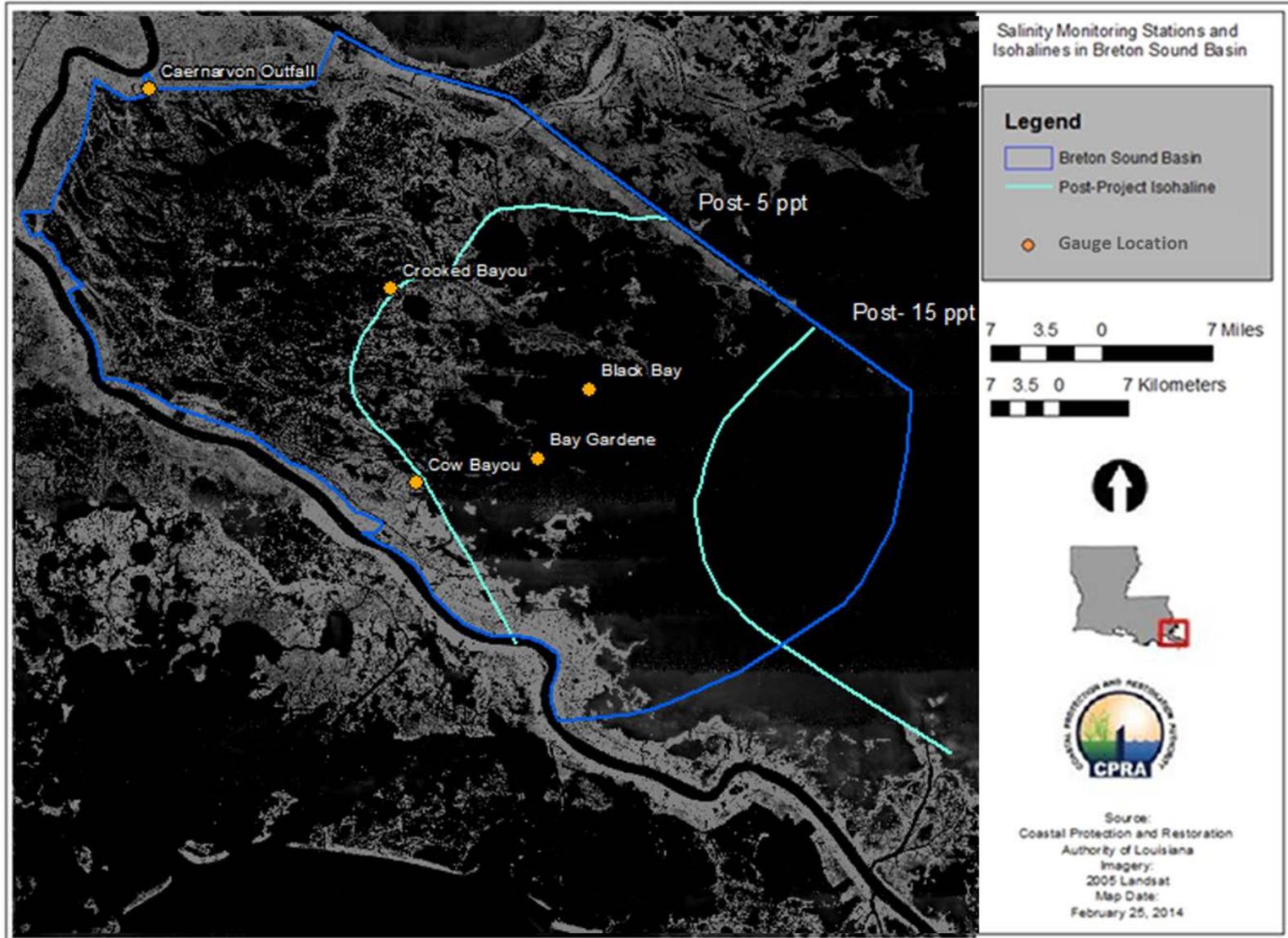




- 2013 Data Results
- 2014 Operations and Maintenance
- 2015 Proposed Operation Plan



Caernarvon Freshwater Diversion Advisory Committee 2014



Caernarvon Operations Range: December-May Bay Gardene Gauge

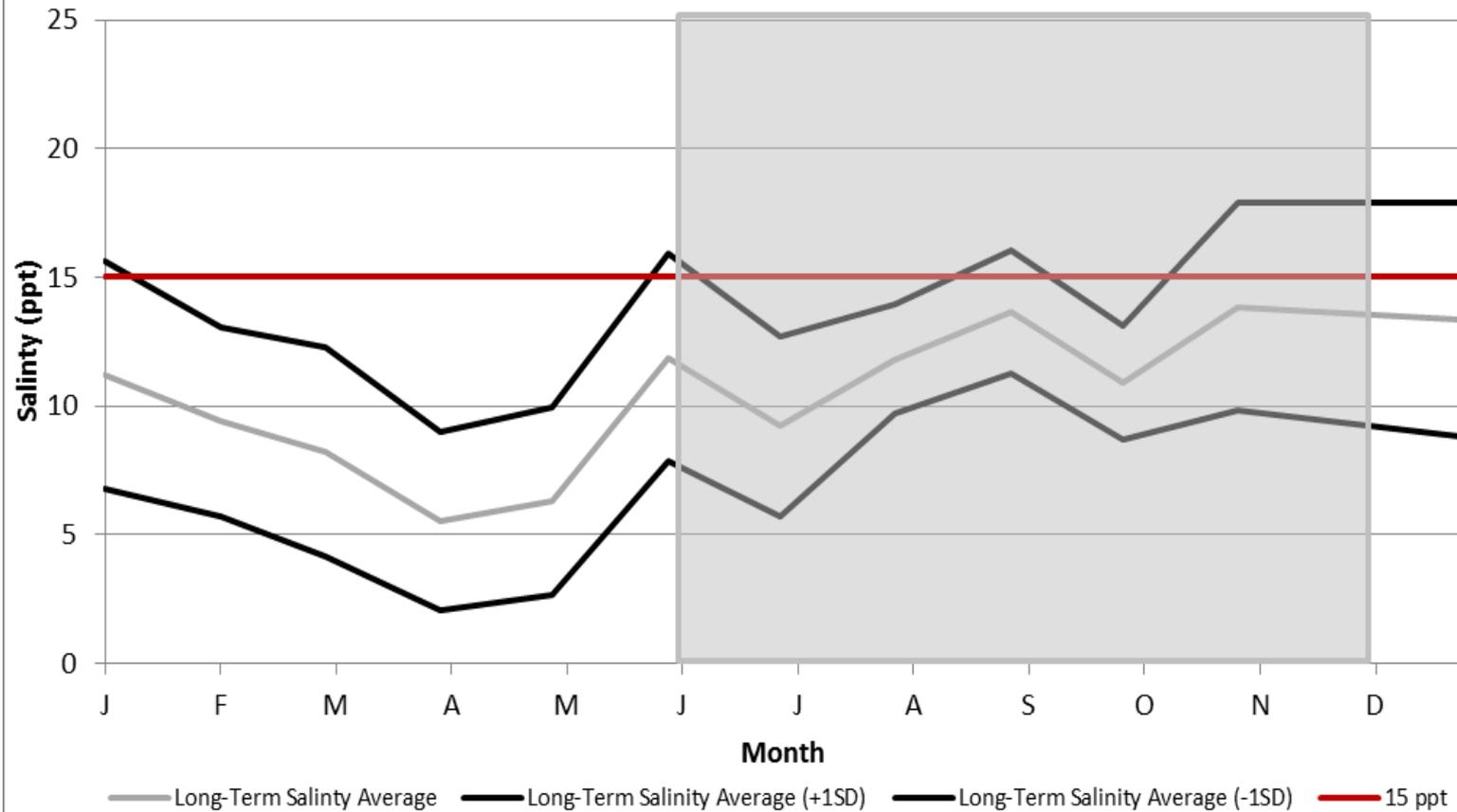


Figure 2. *REVISED* Long term average (+/- 1 standard deviation) salinities from the Bay Gardene Gauge (USGS site 07374527). From December through May the Caernarvon Freshwater Diversion structure may be operated when the 30-day moving average salinity is within or above the data range. Operations will cease if the 30-day moving average drops below the lower limit of the range.

Caernarvon Operations Range: June- November Cow Bayou and Crooked Bayou Gauges

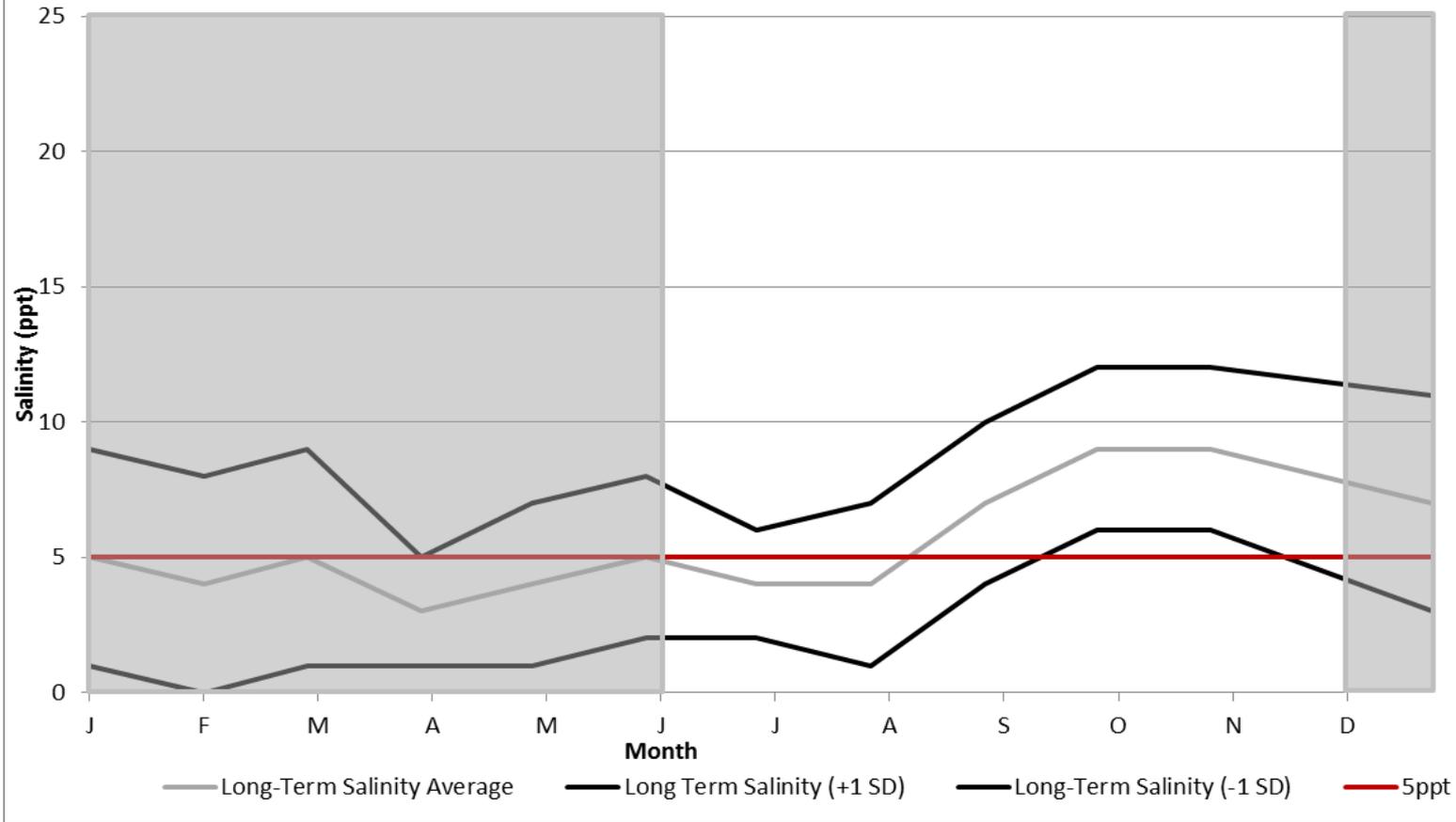
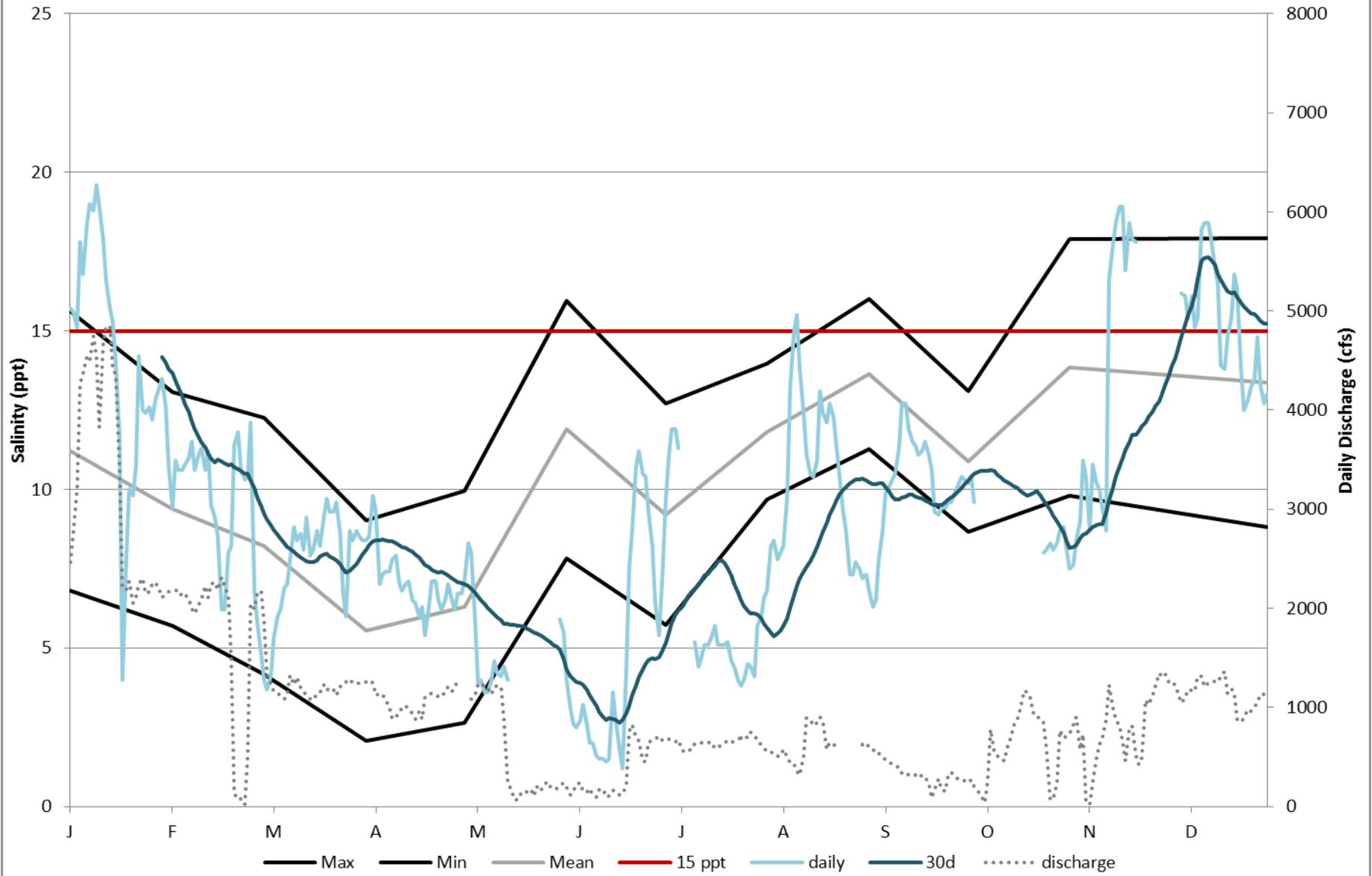
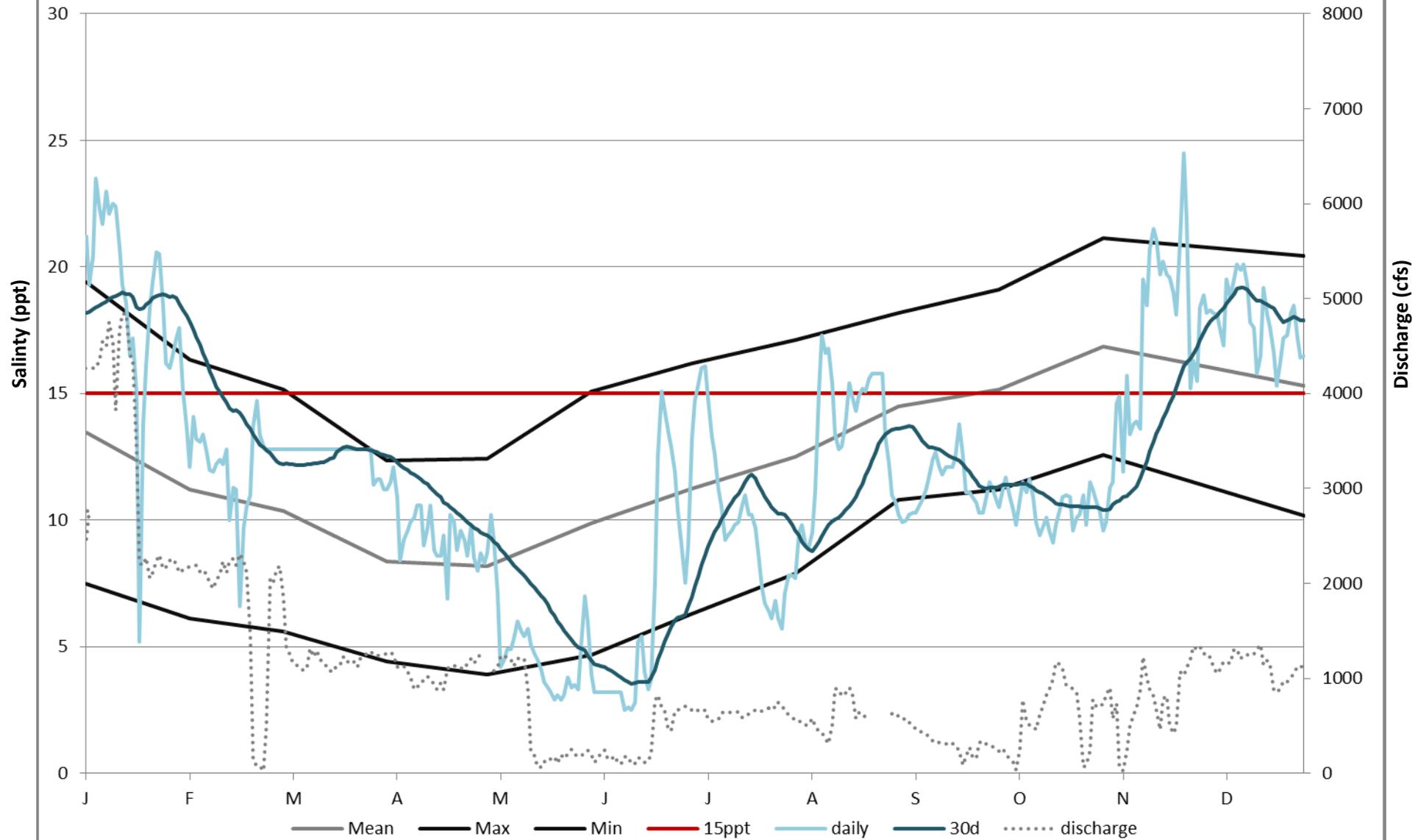


Figure 3. Long term average (+/- 1 standard deviation) salinities from the Cow Bayou (USGS site 073745258) and Crooked Bayou (USGS site 073745257) gauges. From June through November the Caernarvon Freshwater Diversion structure may be operated when the 30-day moving average salinity is within or above the data range. Operations will cease if the 30-day moving average drops below the lower limit of the range.

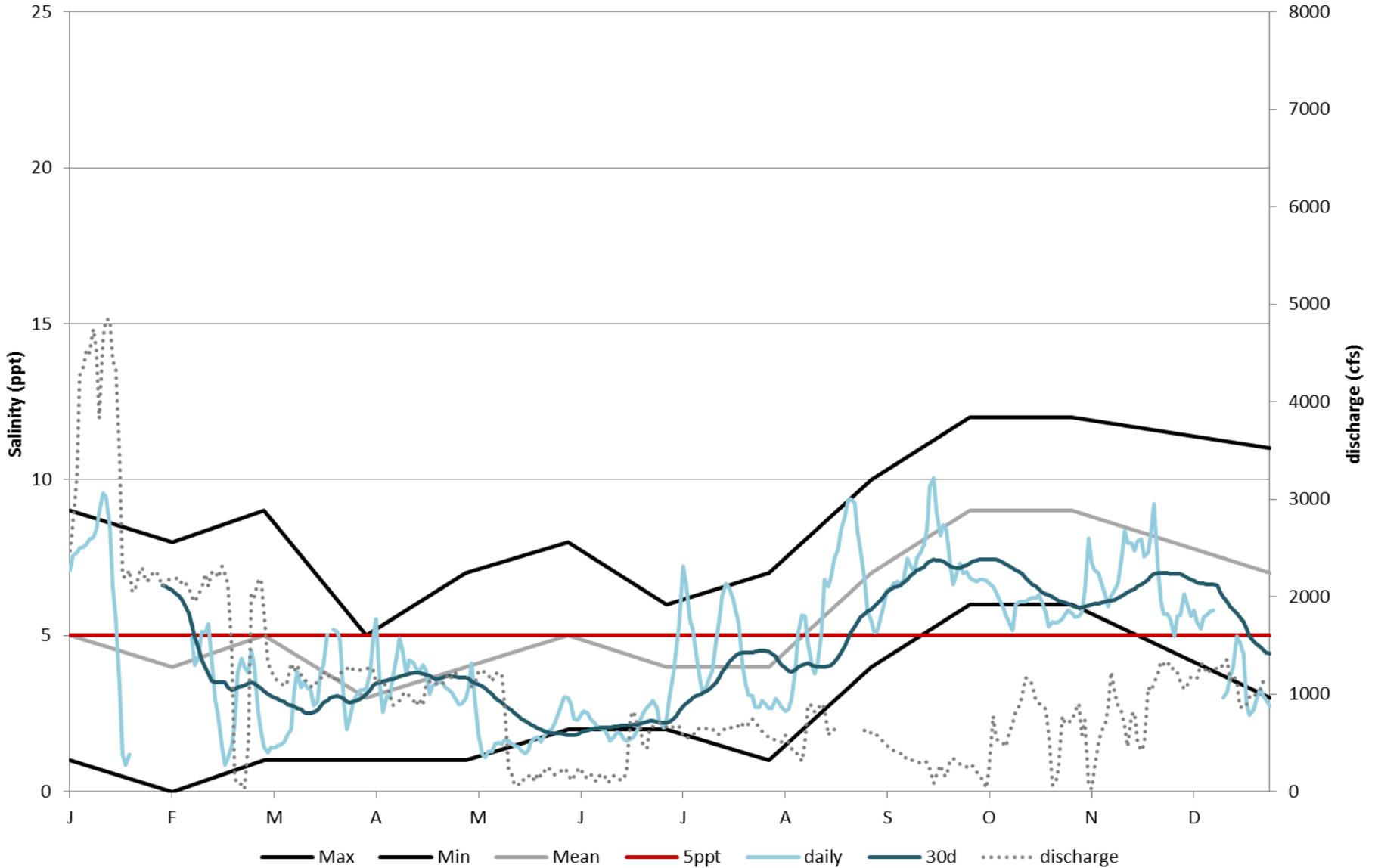
Bay Gardene Moving Average 2013



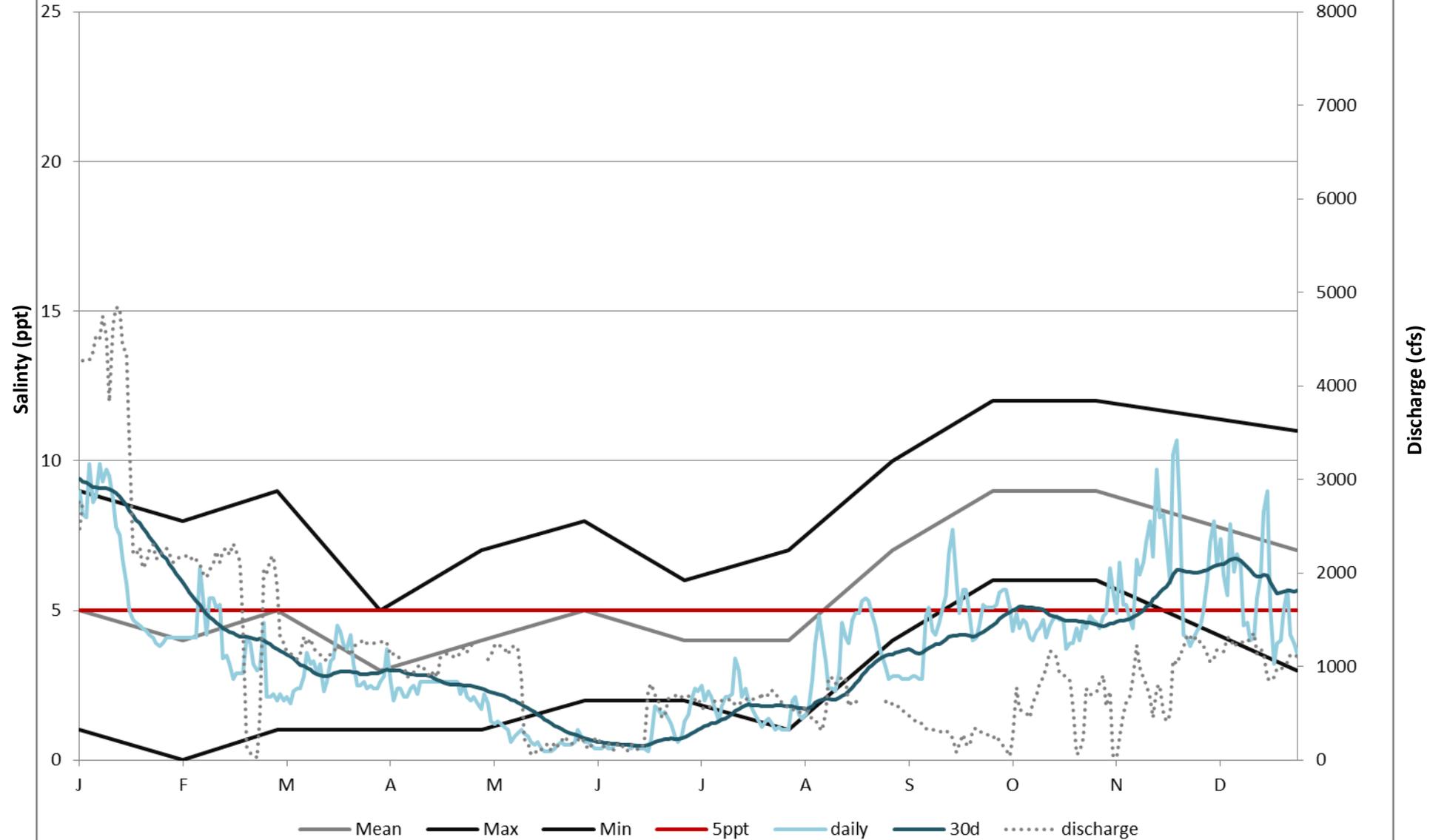
Black Bay Moving Average 2013



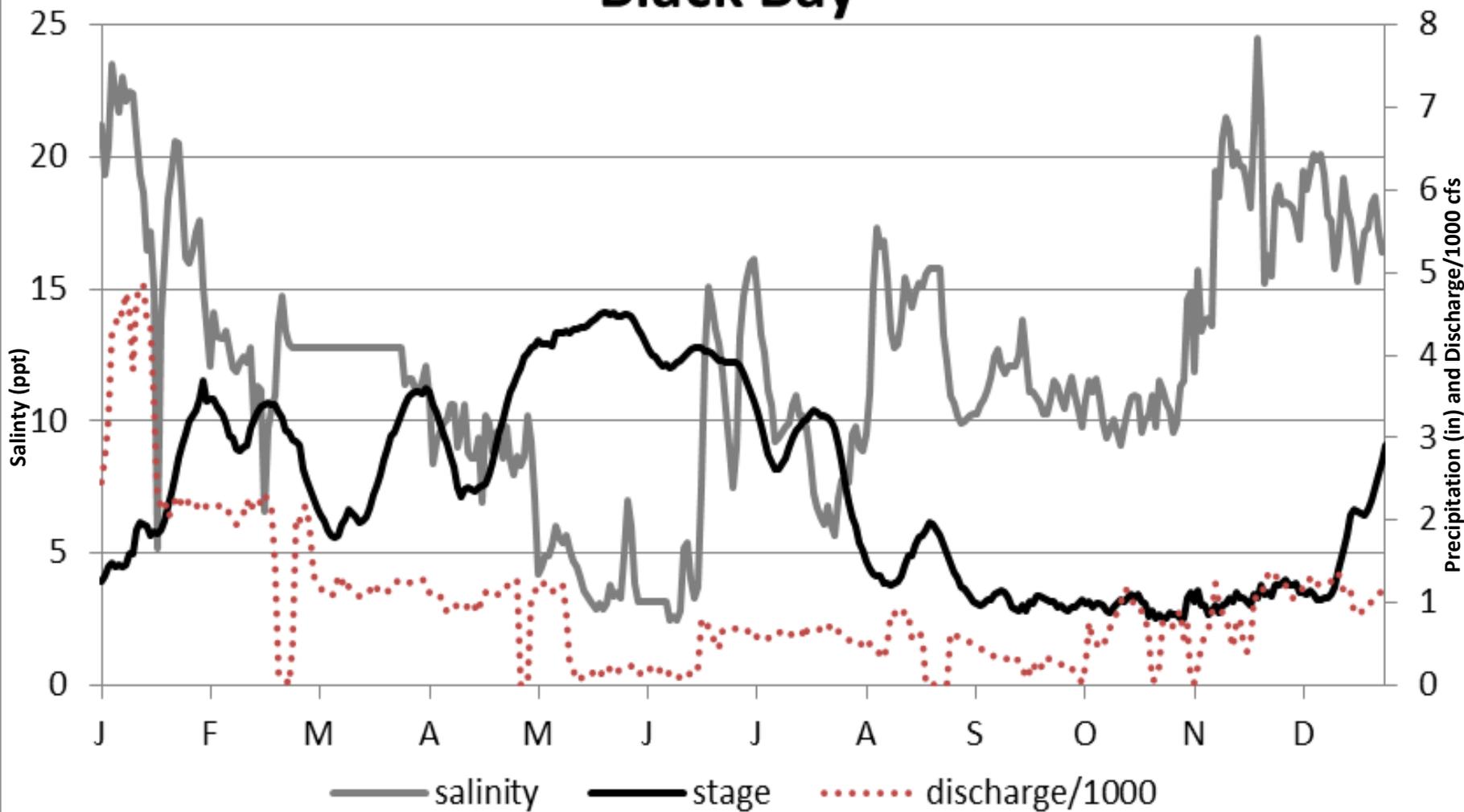
Crooked Bayou Moving Average 2013



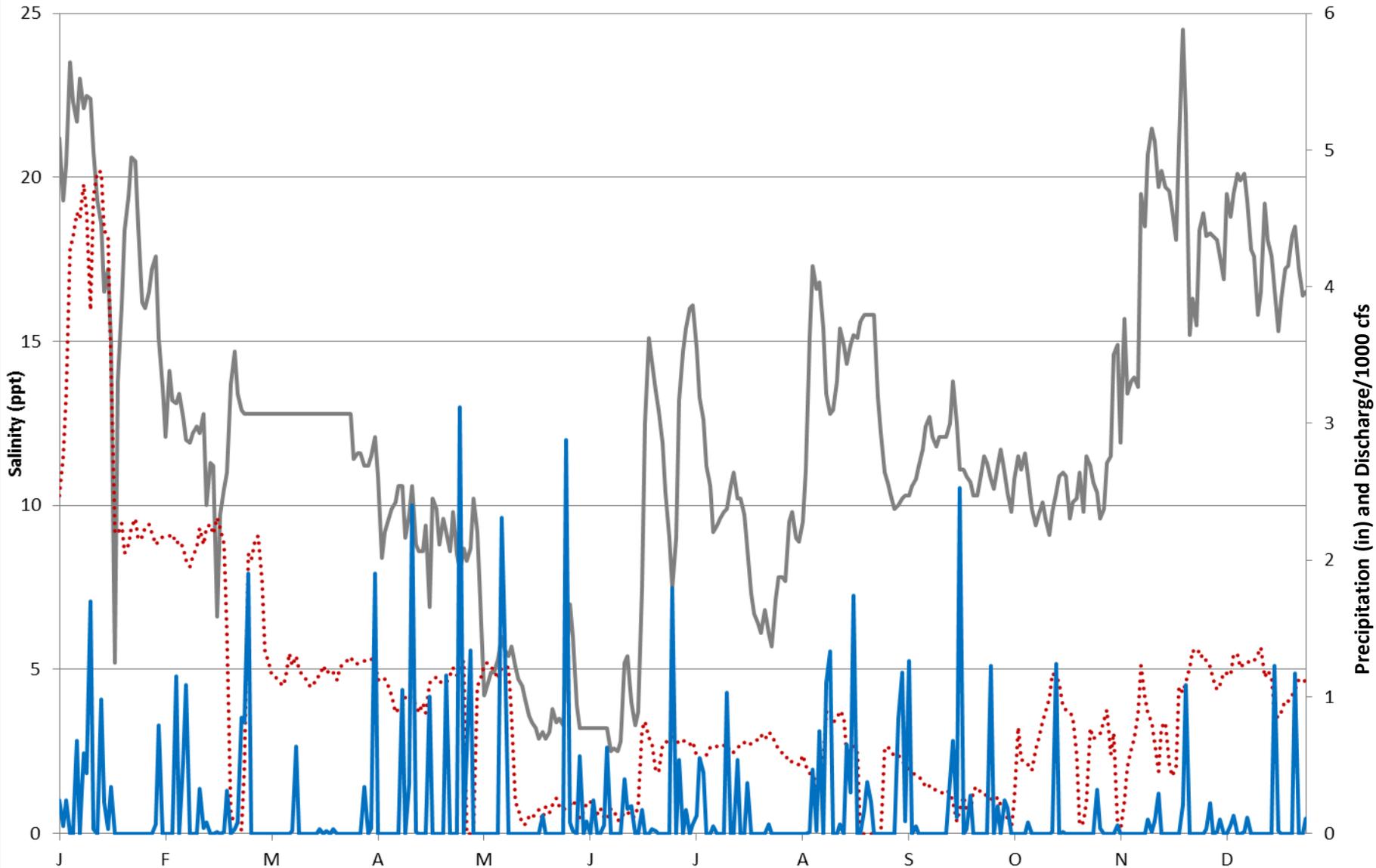
Cow Bayou Moving Average 2013



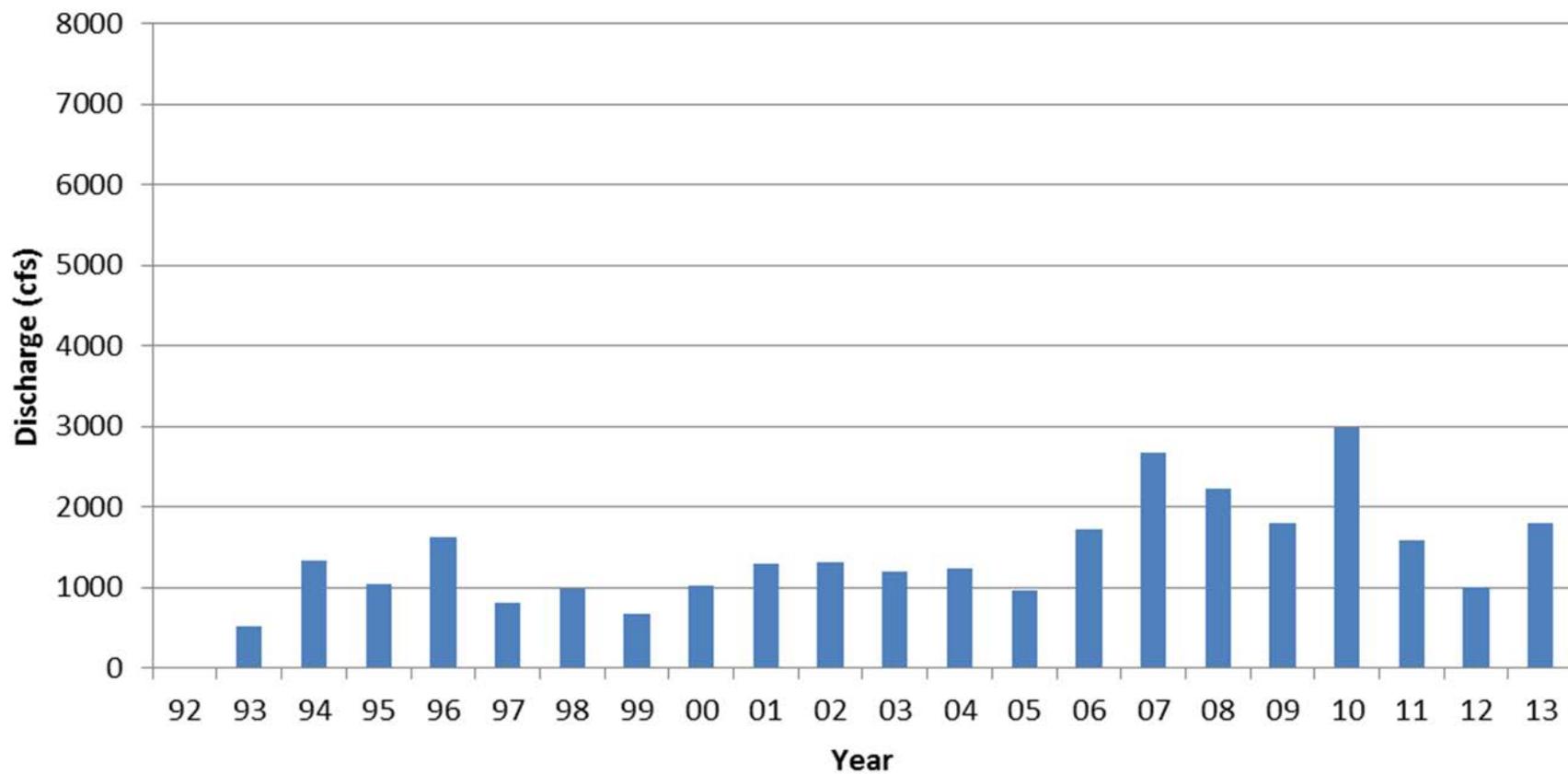
Black Bay



Black Bay



Caernarvon Mean Yearly Flow



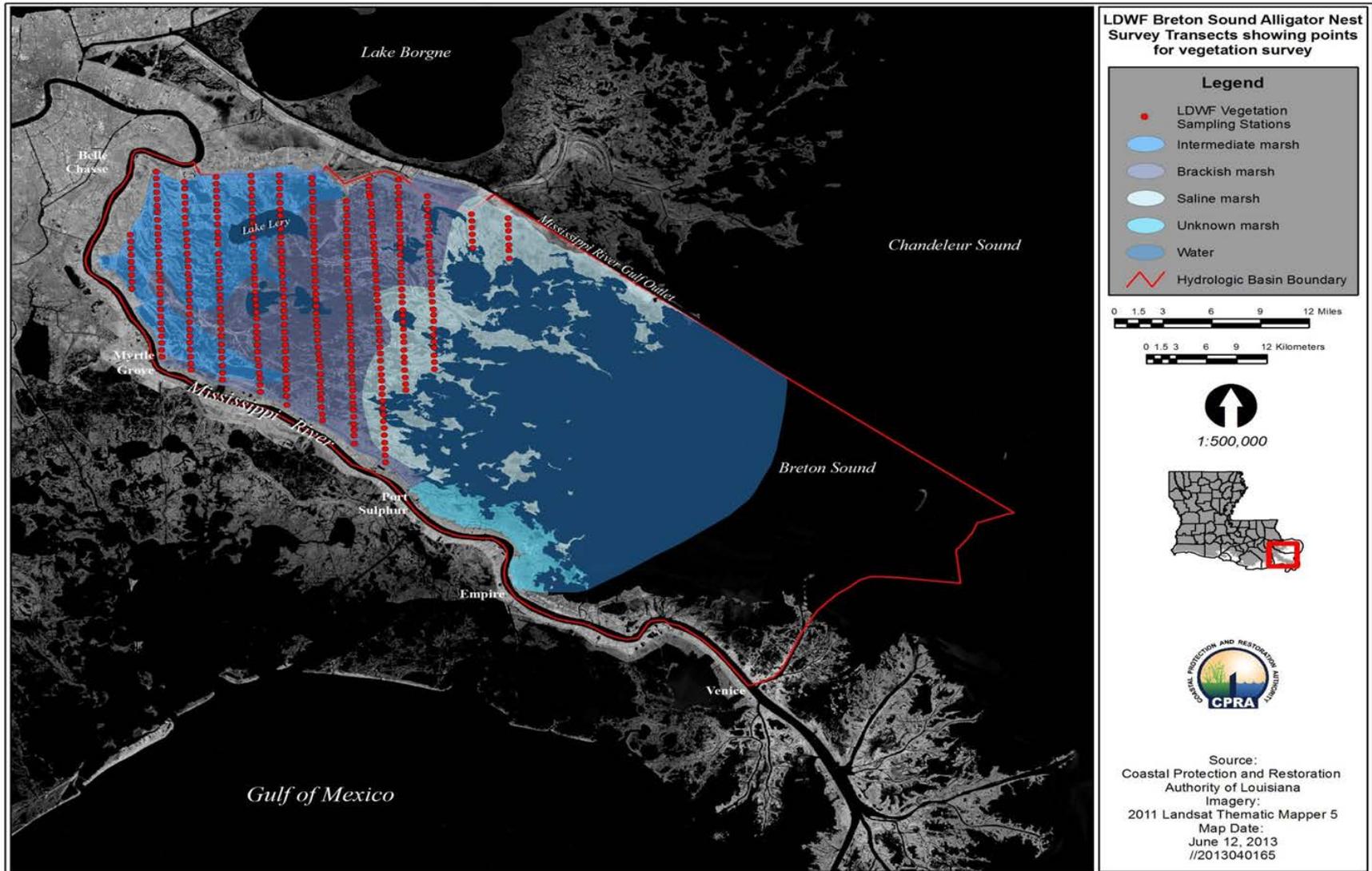


Data Results 2013

- Alligator nests continue to increase
- Oysters continue to be of concern, but consistent with statewide trends
- All other fisheries/wildlife within historical ranges and consistent with natural variations

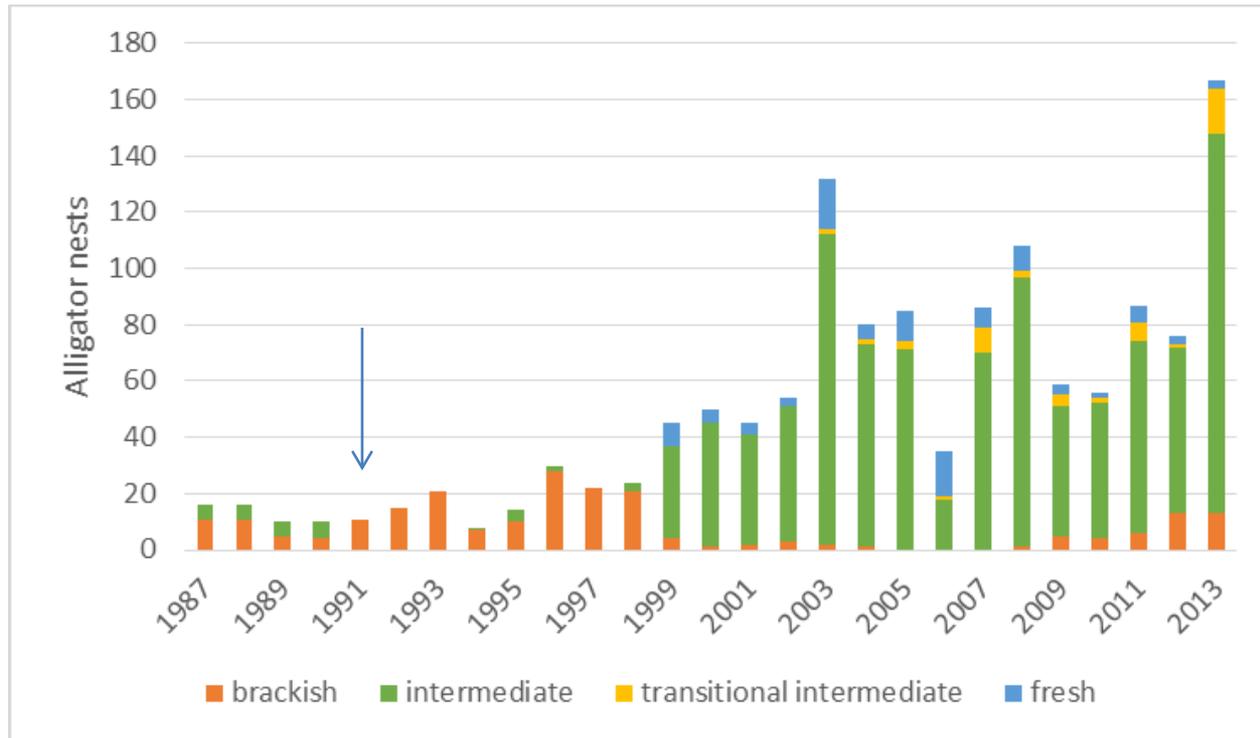


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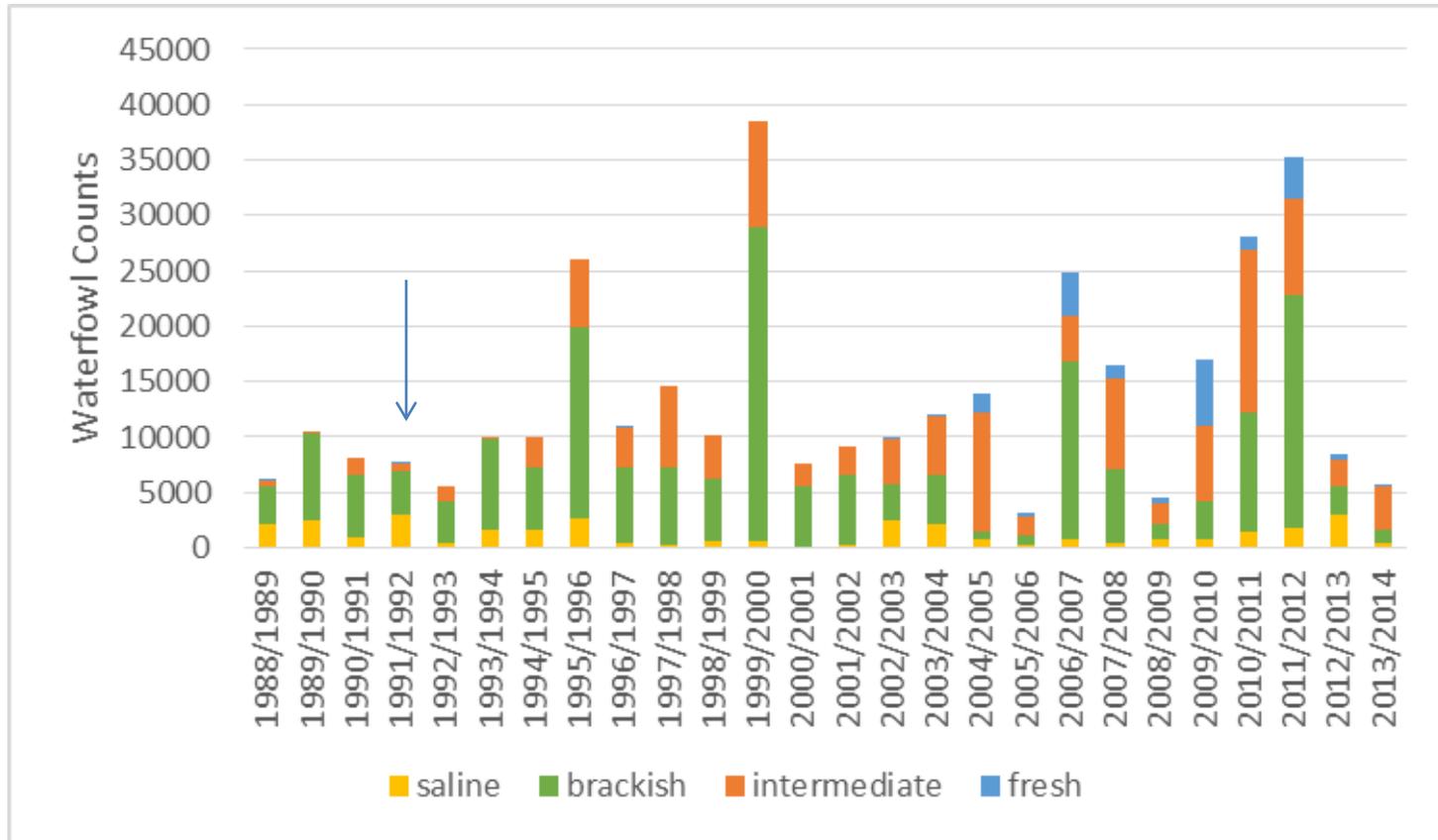


- Alligator nests and harvests continue to improve

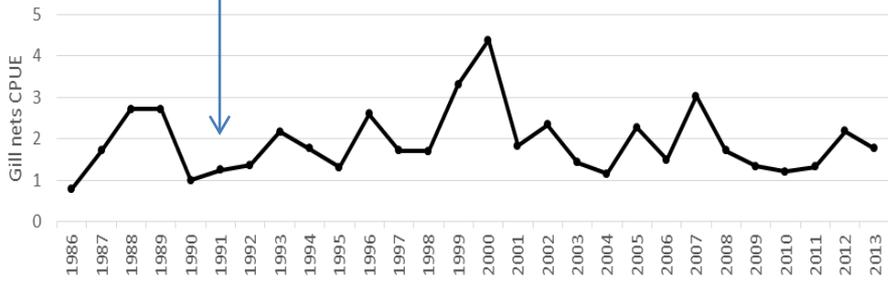




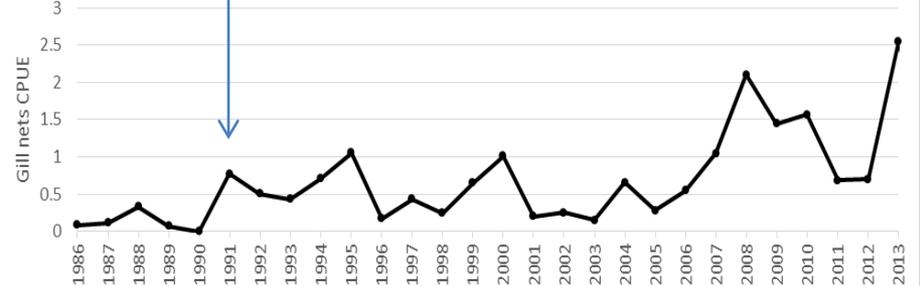
Caernarvon Freshwater Diversion Advisory Committee 2014



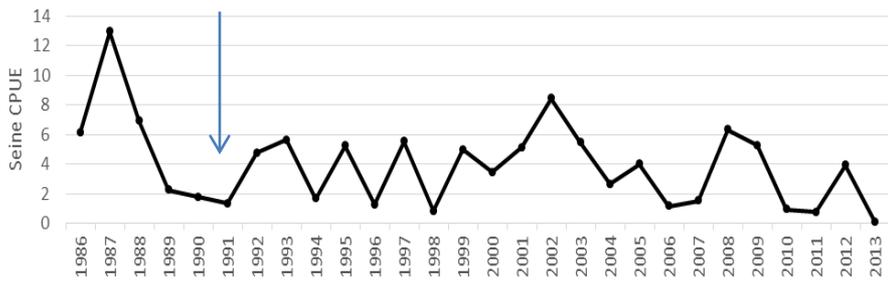
Spotted Seatrout



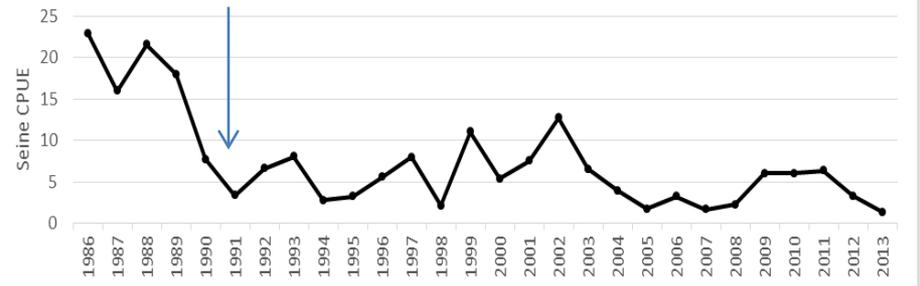
Red Drum



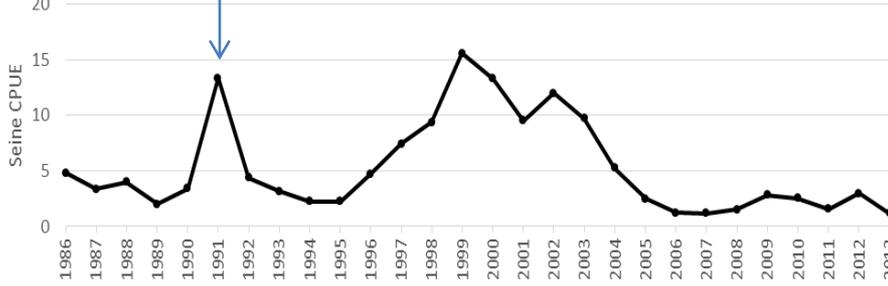
White Shrimp



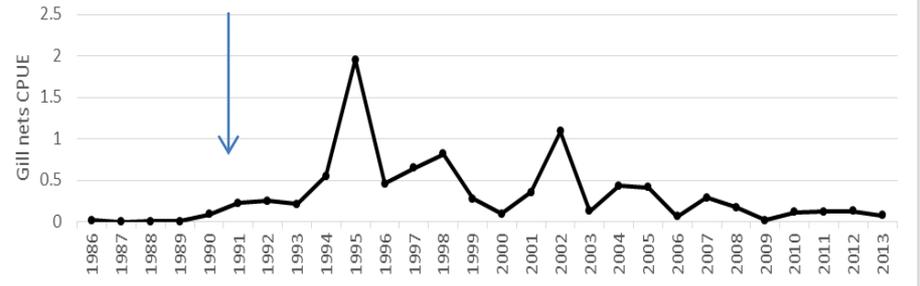
Brown Shrimp



Blue Crab



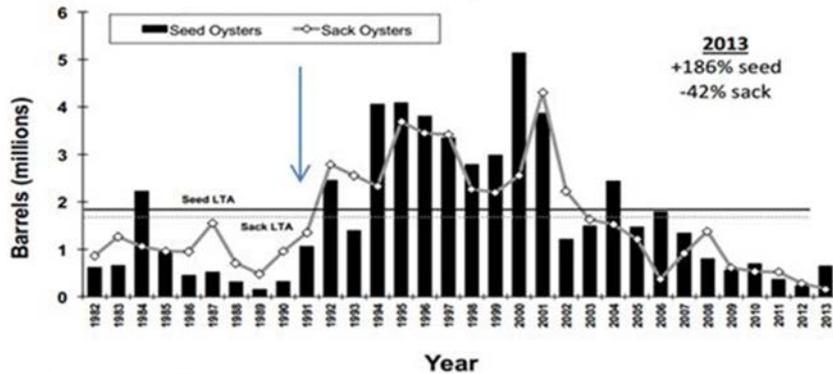
Largemouth Bass





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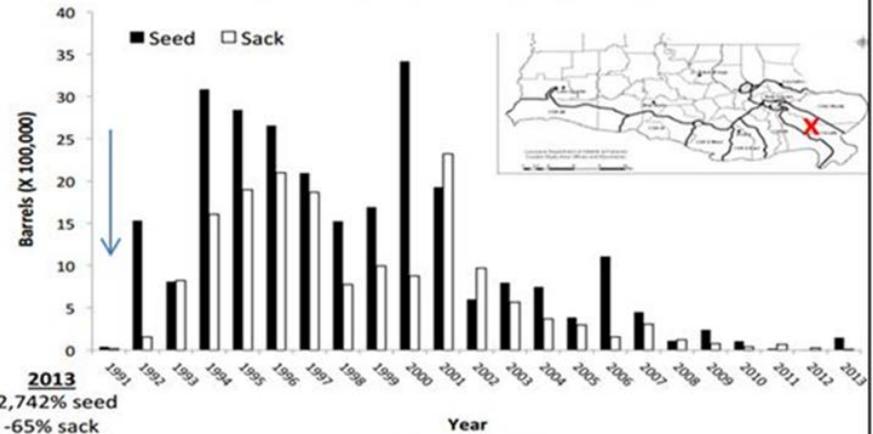
Historical Louisiana Seed and Sack Oyster Stocks



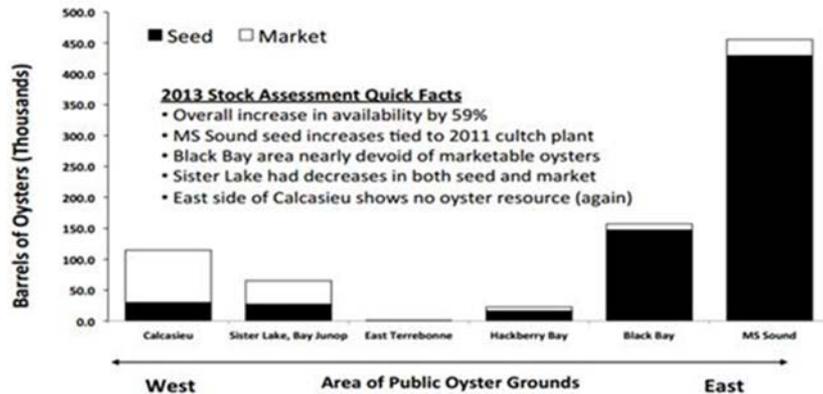
NOTE: 1994-2004 includes CSA I data revision.
All data [except](#) Sabine Lake

CSA 1 – South

(Black Bay, Bay Gardene, Lake Fortuna, etc.)



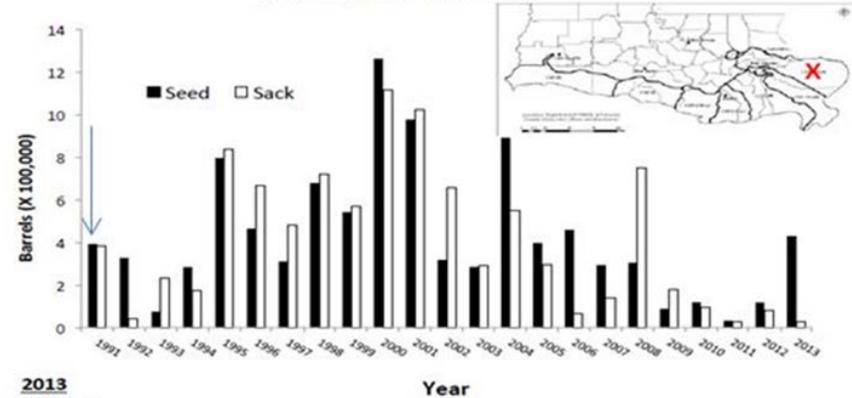
2013 Statewide Oyster Availability

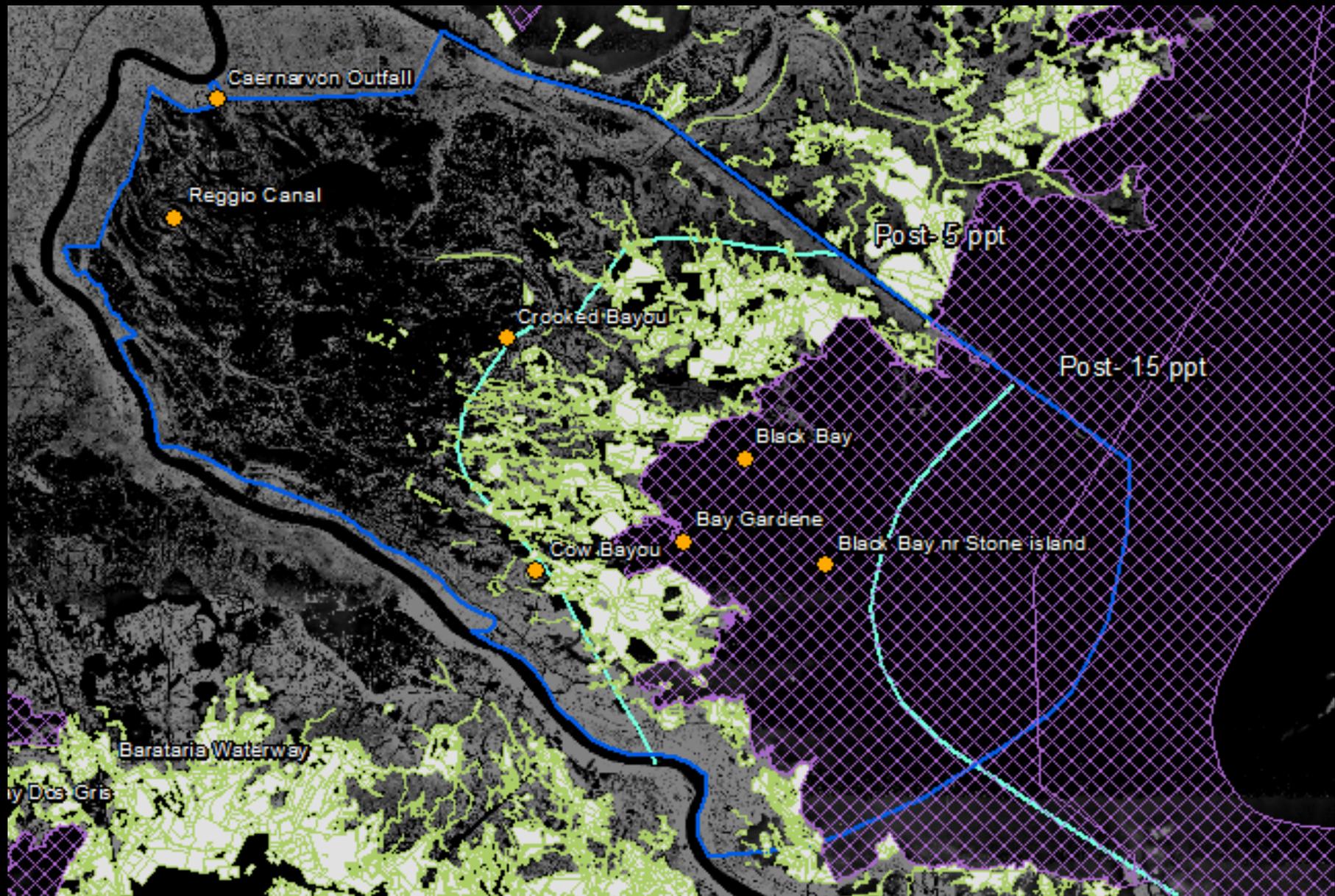


PRELIMINARY DATA - SUBJECT TO CHANGE

CSA 1 – North

(Lake Borgne/MS Sound area)







- Marsh
- Overall land loss
- Big Mar
- Bayou Mandeville

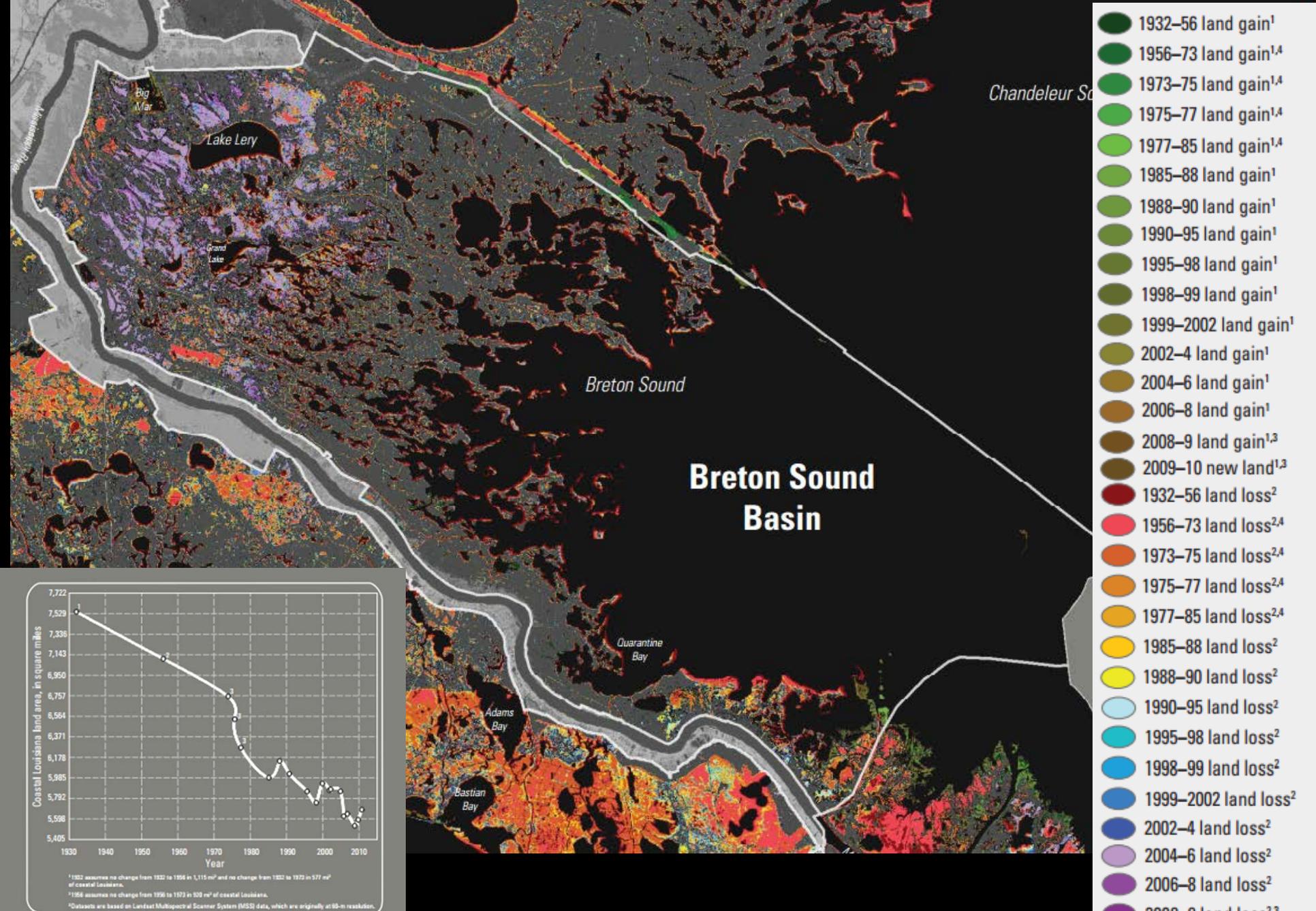


Figure 2. Land area in coastal Louisiana, 1932–2010. Coastwide, net land area decrease from 1932 to 2010 was 1,883 mi². (See table 1 for specific area measurements.)

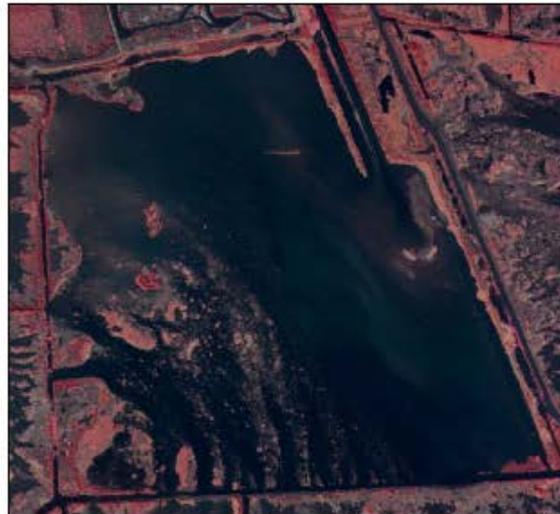


State of the Science: Big Mar, Caernarvon Freshwater Diversion (Henkel et al. 2011; Couvillion et al. 2011)

- 344-600 acres of growth 1998-2010 (29-50 acres/yr), most since 2004
- Able to build land even though Caernarvon was originally built as a 'freshwater water diversion' instead of a 'sediment diversion' and the diversion has been under-operated.



1998: LDNR SONRIS



2005: LDNR SONRIS



2012: Google Map





- Bayou Mandeville at mouth of Lake Lery sedimentation
- Navigation concerns
- Dredging required
- Project in progress to address the issue
- Exploring causes and long-term solutions



2013-2014 Operation Changes

- NORO assumed operational responsibilities
- Switch from Bay Gardene to Black Bay as driver for 15ppt operations.
- Black Bay near Stone island online May 2014
- Fresh year, limited operations

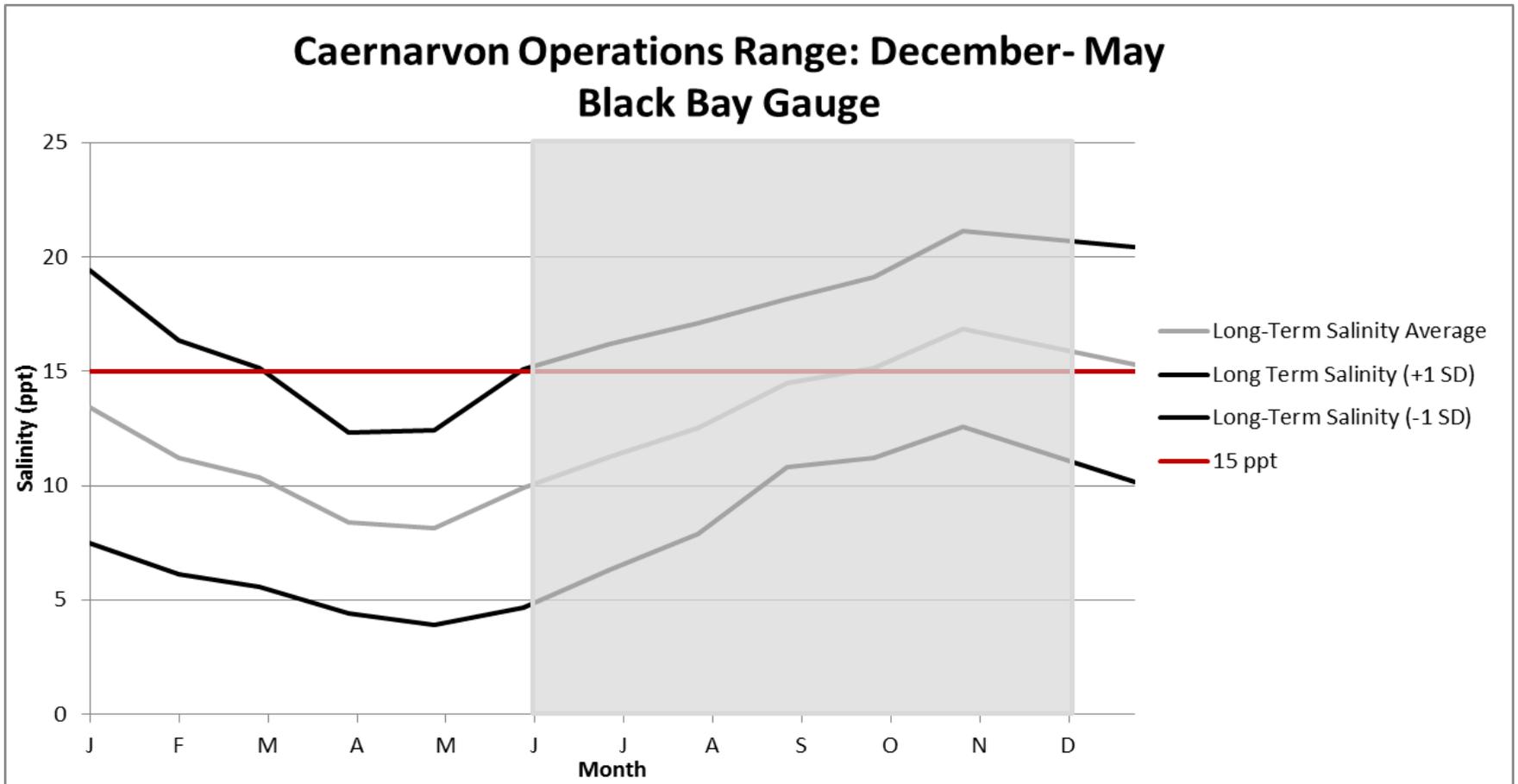


Figure 2. Long term average (+/- 1 standard deviation) salinities from the Black Bay Gauge (USGS site 07374526). From December through May the Caernarvon Freshwater Diversion structure will be operated when the 30-day moving average salinity is within or above the data range. Operations will cease if the 30-day moving average drops below the lower limit of the range. The Black Bay data are temporarily being used to guide operations until a new gauge closer to the 15 ppt isohaline line becomes operational.

Caernarvon Operations Range: June- November Cow Bayou and Crooked Bayou Gauges

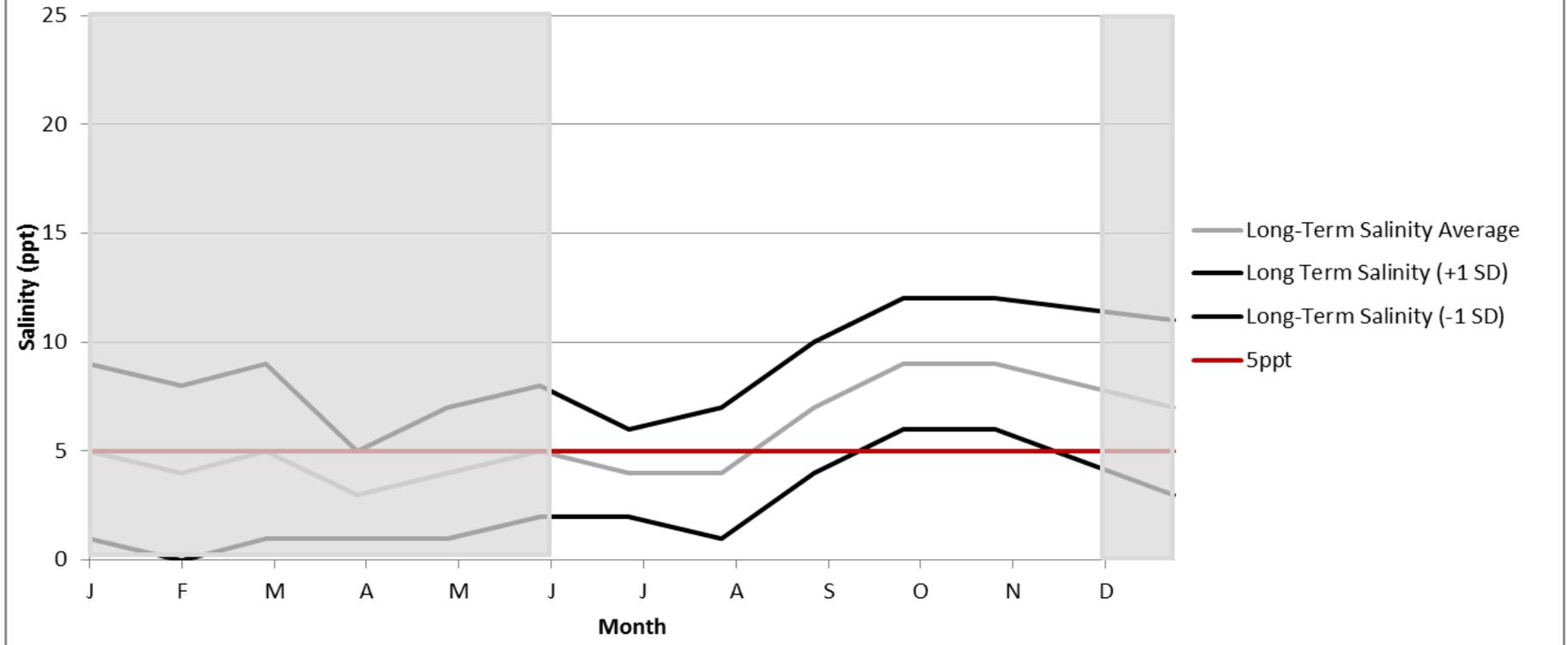


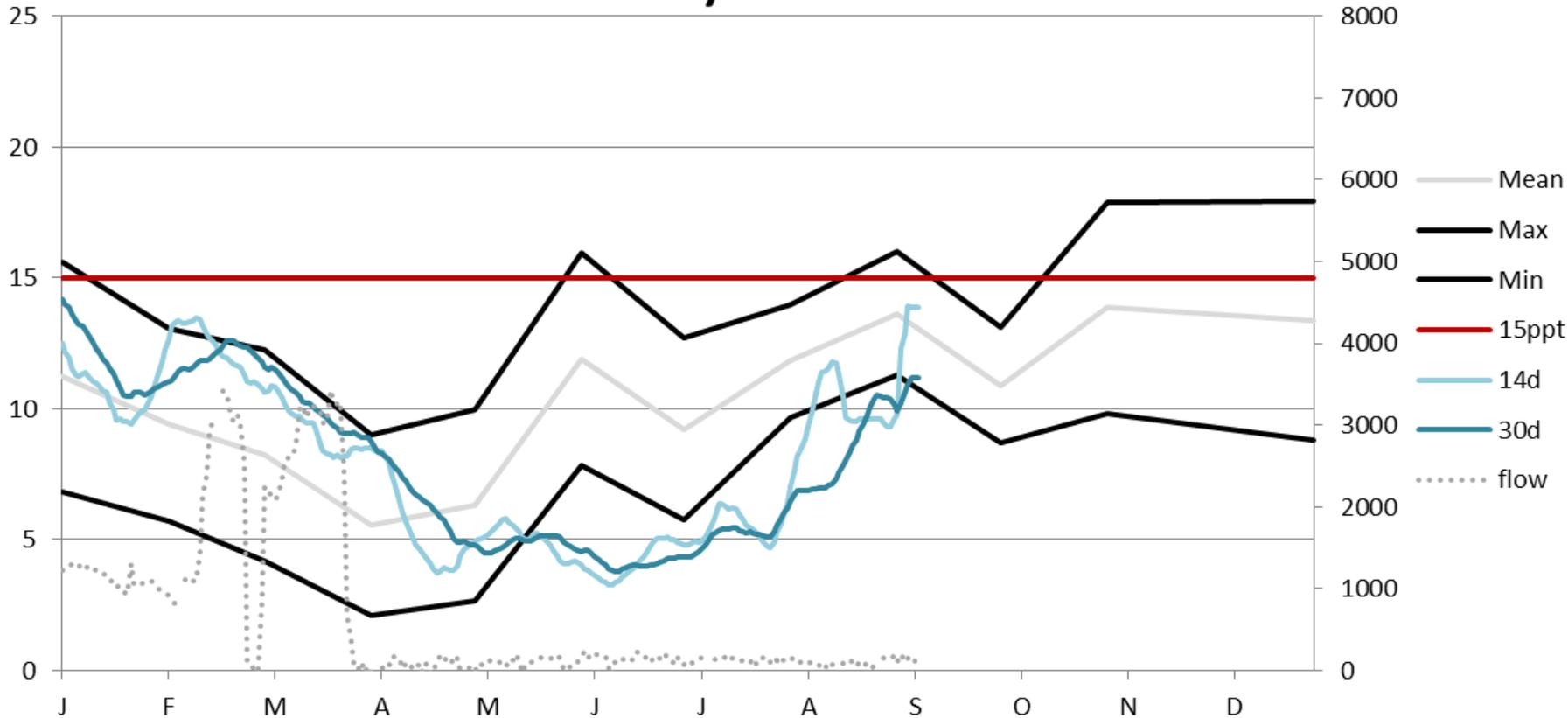
Figure 3. Long term average (+/- 1 standard deviation) salinities from the Crooked Bayou (USGS site 073745257) and Cow Bayou (USGS site 073745258) gauges. From June through November the Caernarvon Freshwater Diversion structure will be operated when the 30-day moving average salinity is within or above the data range. Operations will cease if the 30-day moving average drops below the lower limit of the range.

Black Bay Moving Averages 2014

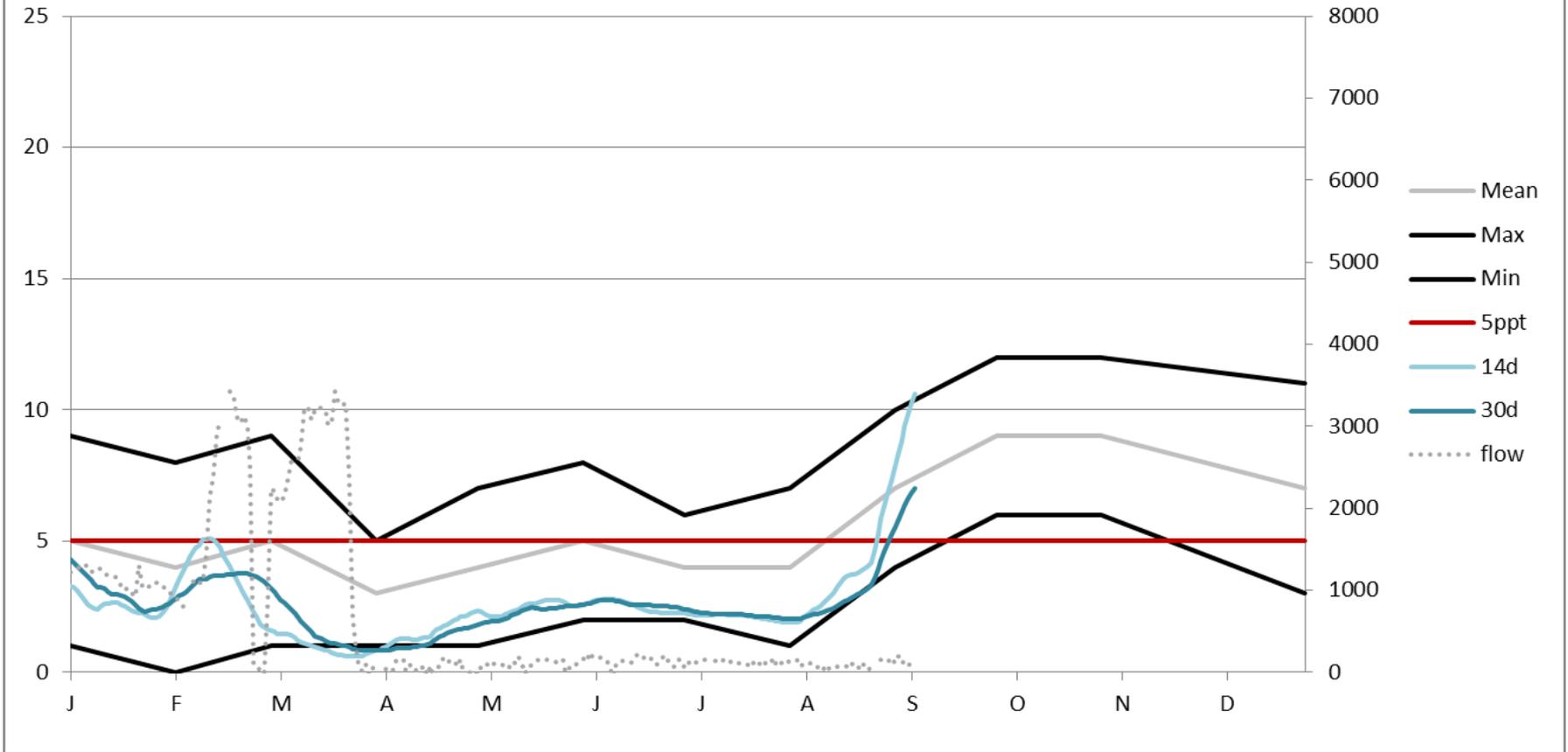
11.3



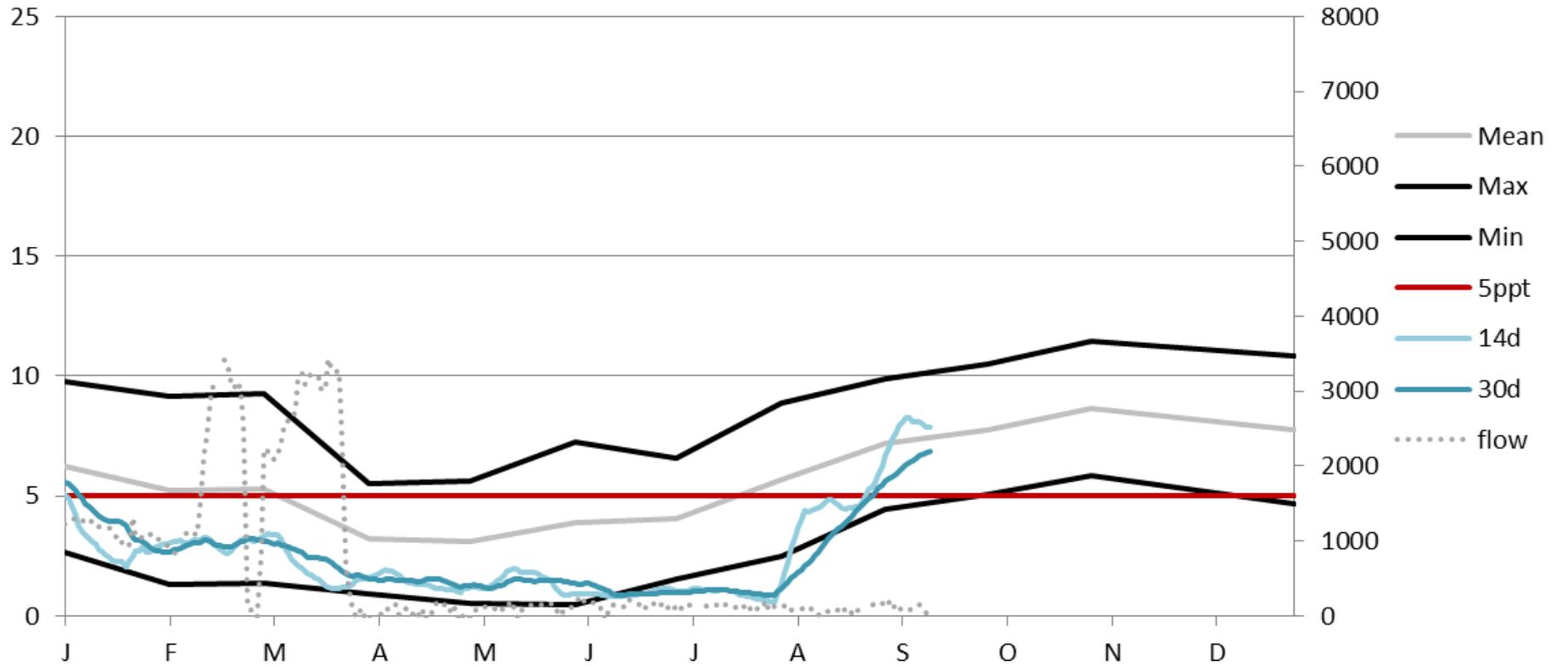
Bay Gardene



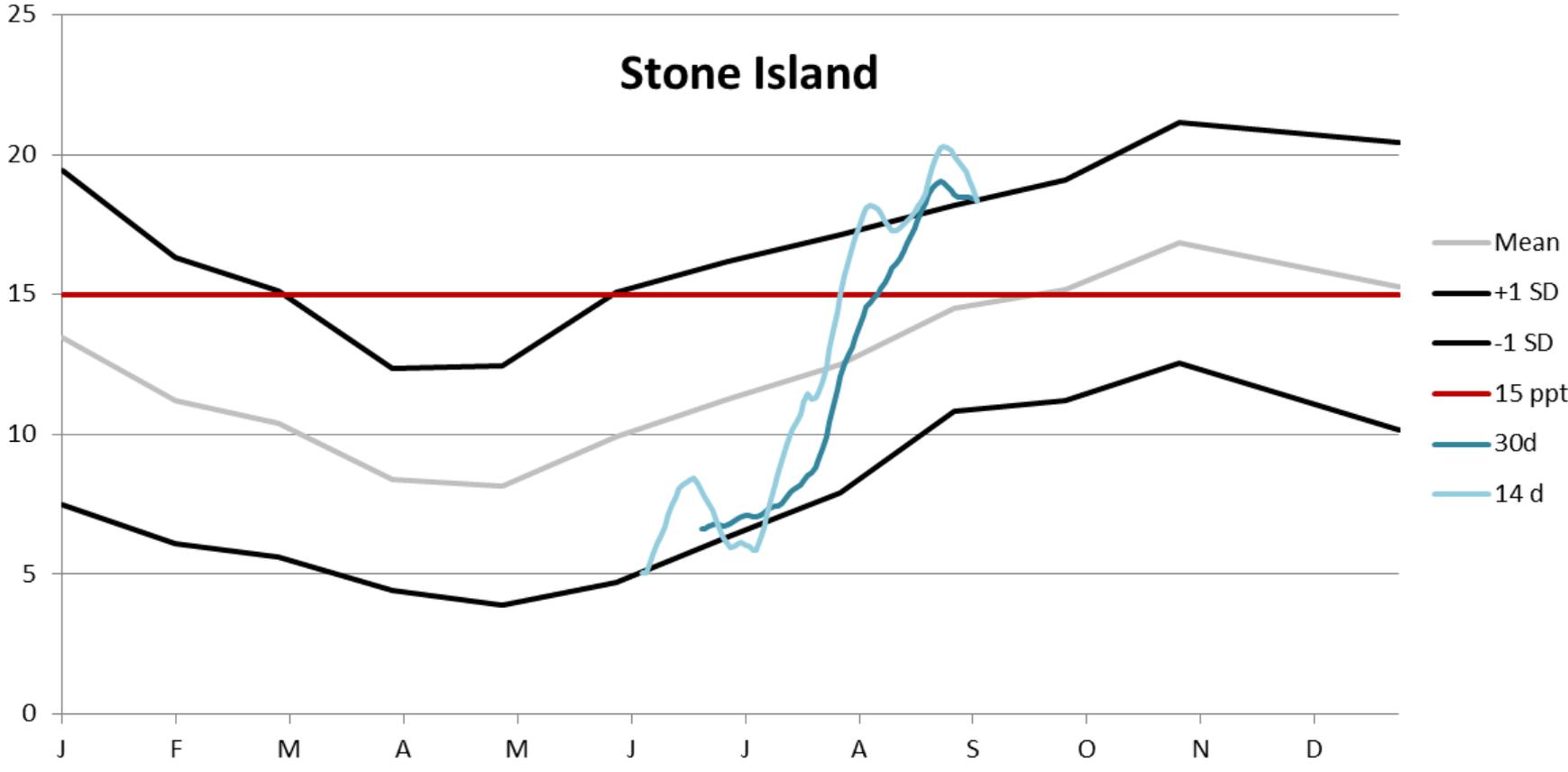
Crooked Bayou Moving Averages



Cow Bayou



Stone Island





2014-Issues Affecting Operations

- Motor repair (completed 6/11/14)
- Braithwaite Levee Construction
 - Anticipated completion 08/2015
 - Low operations only while levees are degraded/under repair (water levels)
 - May affect salinity targets



Structure down from 3/26/14 to present; motor repairs completed 6/11/14, braithwaite levee repairs ongoing issue



Levee Repairs

- Degraded Areas
- Water Level Concerns
- Contractor Issues





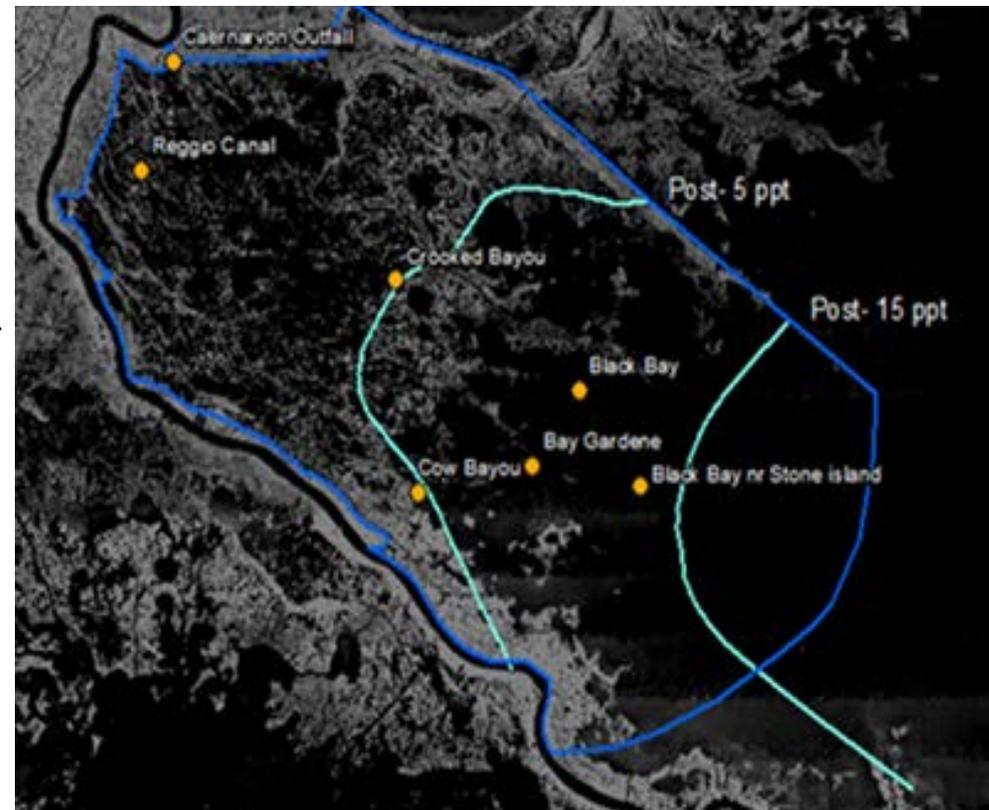
Proposed 2015 Operation Plan

- TWG met 09/16/2014
- “Low trigger” added
- 14-day moving average. Daily, 30-day, and running annual salinities monitored
- Black Bay (15ppt) and Crooked Bayou (5ppt) Long-Term Averages utilized
- Operations not to exceed 7500 cfs

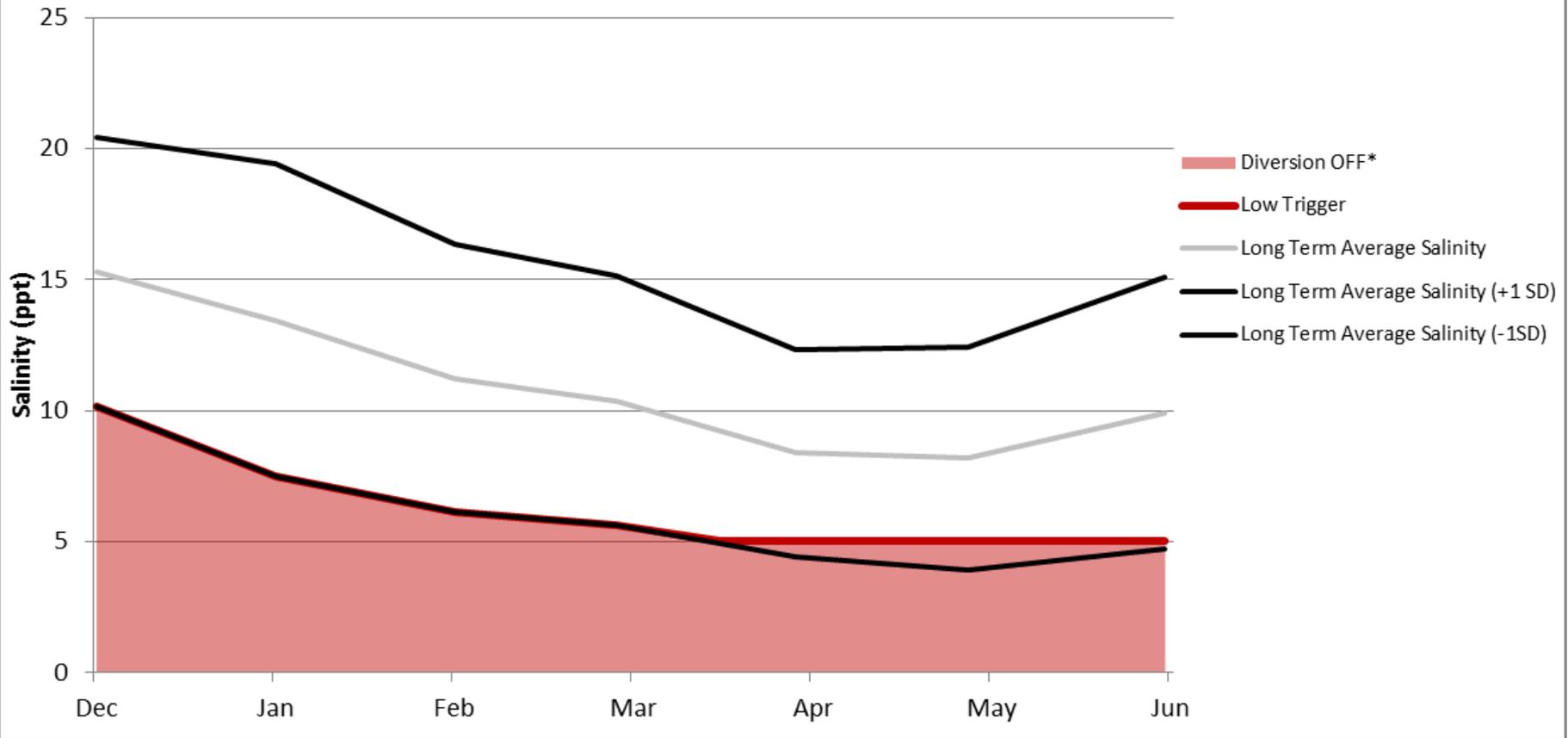


December-May: 15ppt line

- Black Bay nr Snake Island (Black Bay) Gauge
- Bay Gardene and Black Bay nr Stone Island (Stone Island) utilized for supporting information and guidance



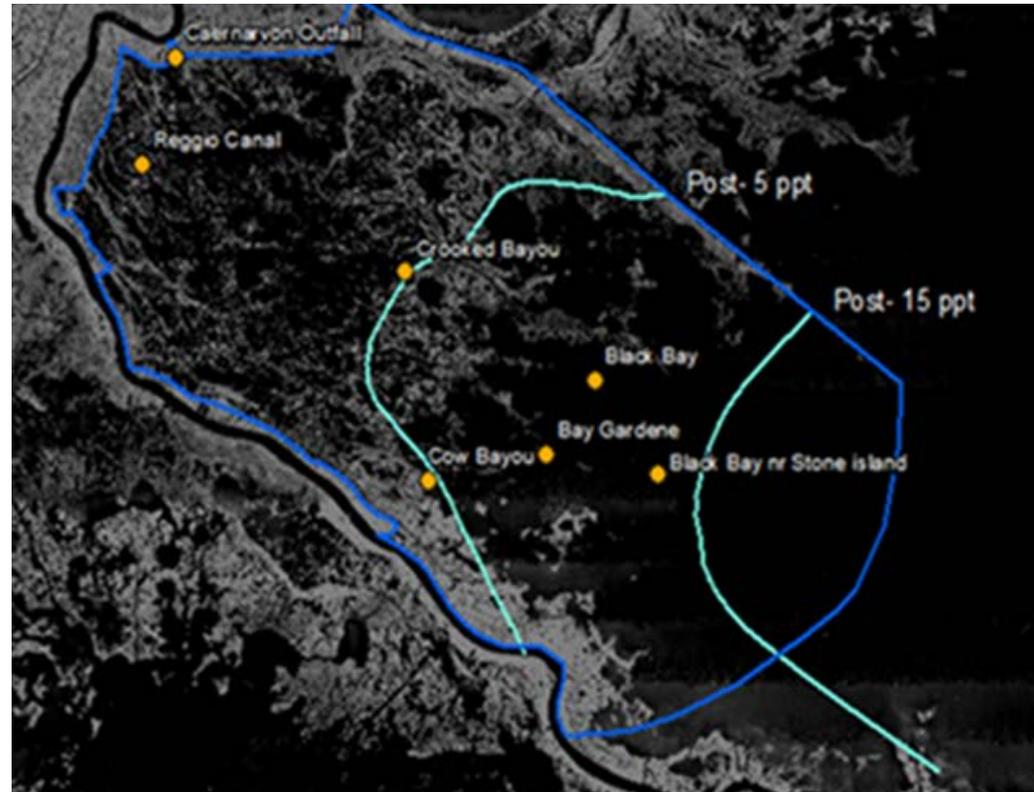
Caernarvon Operations Range: December- May Black Bay Gauge



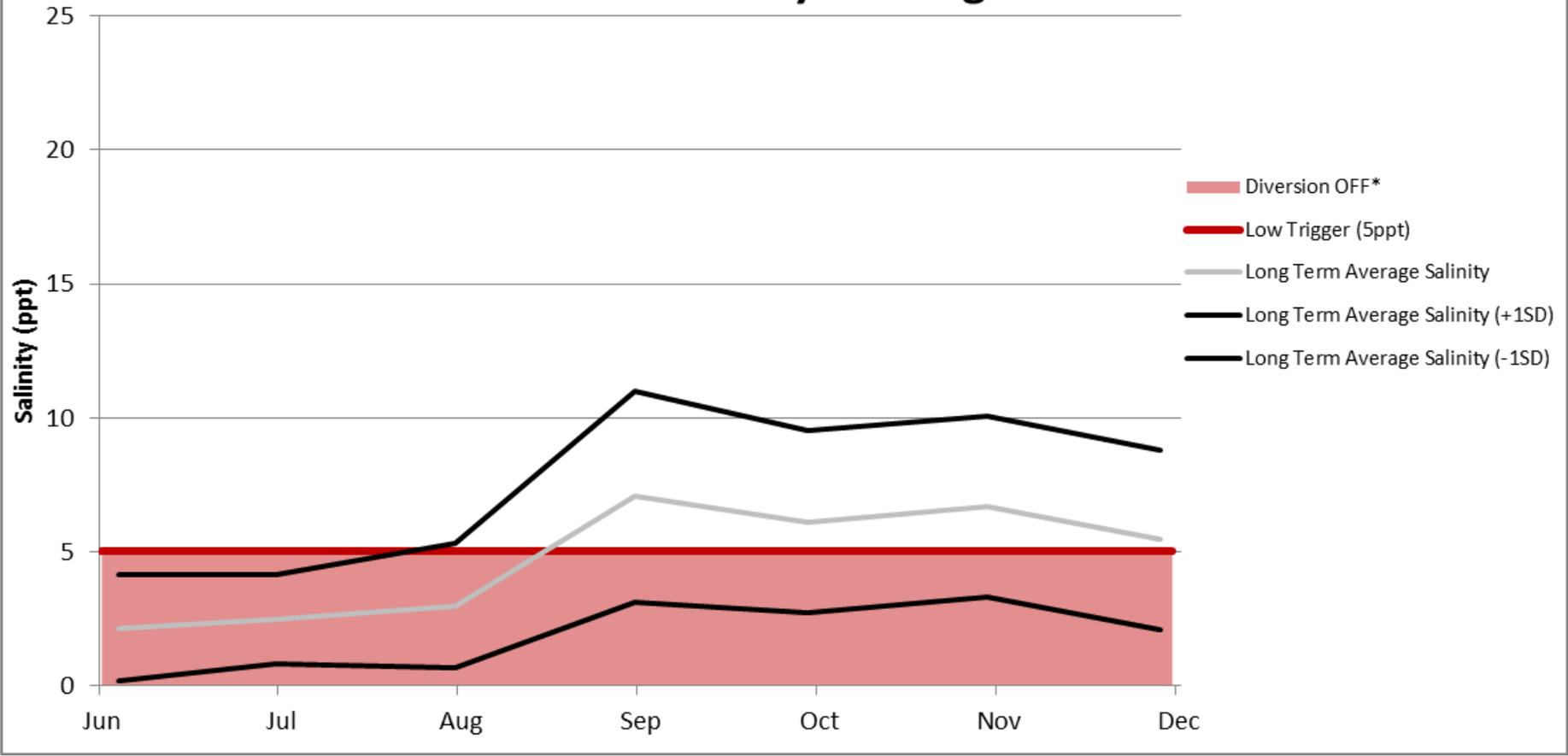


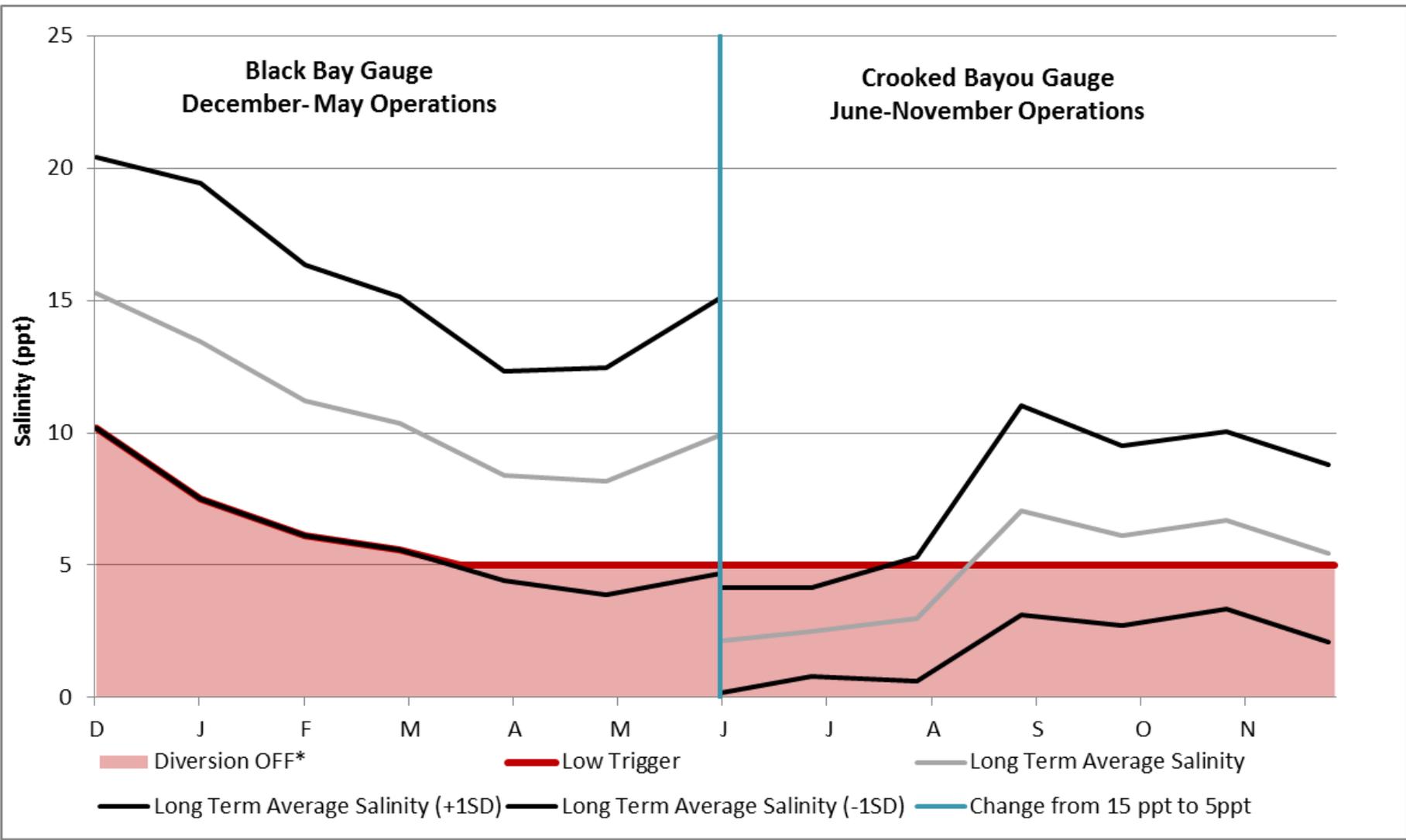
June-November: 5ppt line

- Crooked Bayou
- Cow Bayou Gauge utilized as support and guidance.



Caernarvon Operations Range: June-November Crooked Bayou Gauge







Alternative Operations

- Education and PR visits (outside normal operations)
 - NTE 5000 cfs, return to appropriate output within 2 hours
- Maintenance, Repair and Local issues
 - Evaluated on case-by-case basis
 - Notification to TWG/CIAC members



2014-2015

- More transparency in operations
- More conservative in light of oyster concerns
- Greater focus on salinity ranges
- Monitoring adjustments
 - Nestier trays
 - More robust oyster monitoring program (research)
 - Coastwide monitoring program (SWAMP)

